March 29, 2013

Marlene H. Dortch
Office of the Secretary
Federal Communications Commission
445 12th Street SW., Washington, DC 20554

Dear Ms. Dortch:

Ref: Position and Comments on the *Third Notice of Public Rulemaking WT 01-289*

ACR/Artex (ACR Electronics, Inc.) is the leading development center for emergency beacons that are designed with one purpose in mind: Saving Lives. Through our combined technology and expertise in the marine, aviation, outdoor and military markets, we design and manufacture cutting edge rescue beacons and survival gear for boaters, pilots, hunters, hikers and combat troops, not to mention many of the leading boat builders and aircraft manufacturers in the industry.

ACR/Artex developed and delivered their first ELT in 1990 and brought the industry's first FAA certified 406MHz ELT to the market in 1994. Over the past 19 years the company has delivered more than 50,000 406MHz ELTs which are installed in aircraft as diverse as the venerable Piper SuperCub, to heavy military and air transport aircraft like the Lockheed C-130 and Boeing 777. ACR/Artex has also developed specific equipment for the unique requirements of the helicopter industry. The company's design and manufacturing expertise has produced reliable, durable and industry leading equipment that millions of people rely on every day to contact the proper search and rescue agencies should they find themselves in a most dire situation.

Backed by decades of experience in developing and improving SAR beacon technology and in response to the *Third Notice of Public Rulemaking WT 01-289,* ACR/Artex summits the following comments:

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Paragraph 8:

ACR/Artex supports a phase out of 121.5MHz ELTs. We will comment on the certification, manufacture, importation, sale, and use of 121.5MHz. We support the adoption and proliferation of 406MHz and combination 406/121.5MHz ELTs for reasons of technical and operational superiority in saving lives. Finally, we will comment on the inadequacies of alternative technologies and the ability of manufacturers to meet the demands of a 406MHz ELT mandate.

The superiority of 406MHz technology over 121.5MHz is clearly communicated in terms of location detection, time to respond, and safety and survival of crash victims and rescuers. A 406MHz ELT offers 1-3 nm (2-5 km) position accuracy compared to 12-15 nm (15-25 km) provided by a 121.5MHz ELT. However, by equipping a 406MHz ELT with GPS, the beacon offers accuracy to within 100 yards. This dramatically shortens the time between the accident and the subsequent rescue. This improves safety in two ways. First, by enhancing the ability for victims to receive aid quickly, and second that the risk to SAR personnel is minimized (less flying, less hiking, etc.). In addition, by minimizing the time required to determine the accident location other valuable resources are conserved, i.e., flight time and aircraft maintenance costs, but more importantly provides better utilization of SAR asset deployment.

The implementation of 406MHz ELT registration helps reduce the number of false alerts. A phone or radio call can confirm the validity of the alert preventing unwarranted launching of SAR teams. A 121.5MHz ELT transmits anonymously and the alert cannot be verified. The only way to ascertain the situation is to dispatch resources to investigate the alert. With a 406MHz ELT, the position of the distress can be relayed to rescue services more quickly, more reliably and with greater accuracy, allowing real alerts to receive the attention they warrant.

Paragraph 9:

ACR/Artex concurs with the FCC and FAA position not to allow for the certification of new 121.5MHz ELTs. As outlined in the *Third FNPRM* and other responses from SAR and manufacturers, the 121.5MHz ELT is an inadequate technology for saving lives. SAR authorities rely on the most accurate information available in the most expeditious timeframe possible in order to prosecute rescues and save lives. Based on SAR operational requirements, the decision to stop monitoring of 121.5MHz signals by the global Cospas-Sarsat satellite system

was made in October 2000 and the monitoring officially ended in February of 2009. This action, which allowed for a 9 year transition period, essentially rendered 121.5MHz ELTs obsolete for effective crash alerting and SAR response.

Consider a scenario in which an aircraft crashes and has a 121.5MHz ELT. Detection is dependent on whether anyone in the range area is actually listening on that frequency, so there is a distinct possibility that another aircraft many not be in the area for hours. Although pilots are encouraged to monitor the frequency, many don't hence further delaying the detection of the crash. Given that the 121.5MHz signal is detected by a passing pilot or a ground facility, an air traffic control facility should be notified. From that point, the ATC facility would initiate gathering of information of missing aircraft, nearby fight plans, later arrivals, and other information. The Rescue Coordination Center (RCC) would then be notified. The RCC would attempt to verify that a crash did occur through any information possible and if confirming evidence of a crash is forming, SAR aircraft may be sent on a search pattern mission. In the event of inclement weather which is often associated with crashes, the airborne SAR deployment would be further delayed. The crash site would eventually be homed in on from the air and then ground crews would then start the activity of direction finding on the 121.5MHz homing signal. By the time the crash site is found and survivors reached, many tens of hours could have passed. For remote areas, this time delay could be measured in days.

The scenario and outcomes change dramatically with a 406MHz ELT. An aircraft crashes and the 406/121.5MHz ELT is activated. Cospas-Sarsat satellites pick up the first transmissions from the ELT and transmit back to earth to the Local User Terminals operated by NOAA. The alert messages are directed to the closest RCC based on initial positioning information. This is automatically routed for immediate delivery. The RCC uses registration information to confirm the identity of the beacon and make contact with the emergency contact number in the database for confirmation. The RCC gathers location information from Doppler satellite passes to home in on the incident site. Note that encoded position data from navigation interfaces or GPS enabled ELTs provides even more accurate location data and speeds the time to locate the crash. With confirming information and data, a decision is made to deploy SAR assets to the scene. If warranted, ground crews can still find the site by homing on the 121.5MHz signal with direction finders. The result is that the survivors can be reached in just a few hours.

Timely, accurate information is critical to the mission of SAR authorities and 406MHz technology delivers to that objective. The 406MHz ELT technology has been available for over two decades and the global SAR infrastructure is already in place and proven to be effective in location and rescue scenarios. SAR responders rely on and value the 406MHz ELTs to prosecute there missions. It is far from being an obsolete technology.

Paragraph 10:

There is basically no viable, growing market for these obsolete 121.5MHz devices. ACR/Artex has not certified a 121.5MHz since 1999 and has not manufactured, imported, or sold a 121.5MHz since 2008 and has no plans to do so anywhere in the world. We agree with the FCC proposal to prohibit the continued manufacture, importation, and sale of 121.5MHz ELTs, however, the one year transition period should apply only to the sale of the ELTs. Further manufacture and importation of 121.5MHz ELTs should be prohibited upon the effective date of rule adoption based on the *Third FNPRM*. This would allow for manufacturers, distributors, and retailers to deplete their finished goods inventories of 121.5MHz models so that they would not incur lost profits. More importantly, this would also prevent manufacturers and importers from flooding the market with 121.5MHz ELTs during transition period which works against the adoption of the superior 406MHz technology.

For the same reasons, ACR/Artex supports the opinion that the further sale and installation of replacement batteries, should be phased out over the proposed one year transition to deplete finished goods inventory. The manufacture and importation of battery packs, replacement parts, and other servicing of these units in the field should be prohibited upon the effective date of rule adoption based on the *Third FNPRM*.

Paragraph 11:

ACR/Artex supports the prohibition of the continued use and servicing (including battery replacement) of 121.5MHz ELTs on a specific date no more 2- 3 years from the effective date of rule adoption based on the *Third FNPRM*. Most 121.5MHz ELT's have a 2-5 year battery life replacement, and with few of these ELTs being sold in since the cessation of satellite monitoring in 2009, most of these ELTs will need battery replacement by the end of 3 years. The cost and servicing of this battery replacement would be more effectively applied on the transition to a

new 406/121.5MHz ELT. It is acknowledged that a very few aircraft many need to have the 121.5MHz ELT replaced prior to battery expiration.

ACR/Artex specifically does not support permitting ELTs to be serviced, upgraded, and refit with batteries until the end of their useful life. It is often unclear as to what the definition of “useful life” is and it certainly not consistently defined or labeled across manufacturers. This ambiguity would lead some pilots to keep their 121.5MHz until the unit “dies”, which may not which may not be evident until too late and after an accident has occurred. Use of the battery expiration provides a regulated, labeled reference point to define a date for prohibition of further use.

Paragraph 12:

ACR/Artex supports a mandatory transition to 406 or 406/121.5MHz combination beacons. The cost of this transition is difficult to calculate since the number of affected aircraft is not clearly defined. What is known and well understood is that 406/121.5MHz ELTs have been on the market and being installed on aircraft for over 20 years. Aircraft manufacturers who install ELTs only buy and install 406/121.5MHz ELTs. What we can say is that the cost of ELTs have decreased on a steady basis for years, and that in the face of increased market demand, the competitive pressures will reduce the costs further.

Paragraph 13:

Inventory of 406 or 406/121.5MHz combination ELTs is not the issue, since most manufacturers build to order and do not hold significant finished goods inventory. Manufacturing capacity, including the supply chain to necessary components, is what is important. The industry has demonstrated the ability to respond to various international ELT mandates, ramping and scaling capacity to ~300% in a 14 month period in some instances. The assessment of ACR/Artex is that there is more than sufficient manufacturing capacity and depth in supply chain to meet the demand of outfitting all general aviation aircraft with 406/121.5MHz ELTs over the proposed 2-3 year period. We encourage AEA to support the deployment and installation of the 406/121.5MHz ELTs with advanced planning, training programs, and communication to installers.

Paragraph 14:

The use of 121.5MHz ELTs have limited residual benefits in the detection and locating of an aircraft crash. It is useful to consider the general timeline of a 121.5MHz ELT activation for illustration purposes. We cite information and references from the *FAA Aeronautical Instruction Manual* (7/26/2012) and the *FAA SAR Operational Roles and Responsibilities (Arel)* presentation from the NTSB SAR Forum (7/18/2012).

- An aircraft crashes and the 121.5MHz ELT is activated.
- Passing aircraft are encouraged to periodically monitor 121.5MHz and might pick up the signal immediately or hours later.
- If indeed, a passing aircraft hears the alert, the pilot is to contact the nearest air traffic facility and report the positions when the alert is first and last detected and the signal strength of the 121.5MHz. Note that this area can be hundreds of square miles depending on the altitude.
- ATC checks for overdue flights, lost radio contract, confirmation of flight plan which can take up to an hour to notify RCC of the reported alert. ATC issues an Alert Notification and within an hour gives updates to the RCC. At this point the ATC facility provides assistance and support.
- A missing flight would need to be matched with a 121.5MHz ELT activation through flight plans, radar, and other information. This confirmation process can take hours. If a flight plan was not filed, 36 hours normally pass before family concern initiates an (alert).
- If there is additional evidence of a crash, the RCC search planes could be launched to start a search pattern.
- Once the 121.5MHz signal is generally located, a ground team can be dispatched. At this point the 121.5MHz homing signal is useful to direct the ground team toward the crash site. Local terrain will affect the usefulness of the direction finding activity.
- By the time the crash site is found and survivors reached, many tens of hours could have passed. For remote areas, this time delay could be measured in days.

Now consider an illustrative timeline of at 406/121.5MHz beacon activation. References are cited from the presentation *Air Force Rescue Coordination Center (Porter)* at the NTSB SAR Forum (7/18/2012).

- An aircraft crashes and the 406/121.5MHz ELT is activated.
- Cospas-Sarsat satellites pick up the first transmissions from the ELT and transmit back to earth to the Local User Terminals operated by NOAA.
- The alert messages are directed to the closest RCC based on initial positioning information. This is automatically routed for immediate delivery.
- The RCC uses registration information to confirm the identity of the beacon and make contact with the emergency contact number in the database for confirmation.
- The RCC gathers location information from Doppler satellite passes to home in on the incident site. Note that encoded position data from navigation interfaces or GPS enabled ELTs provides more accurate location data and speeds the time to locate the crash.
- With confirming information and data, a decision is made to deploy SAR assets to the scene.
- In the event that the crash site is occluded from visual location by tree cover, rock terrain, or even inclement weather, ground crews can still find the site by homing on the 121.5MHz signal with direction finders.
- By the time the crash site is found and survivors reached, only a few hours have passed.

It should be noted, that the ability to locally home in on a crash site can be better achieved with 406MHz technology which is superior to 121.5 homing. There is 406MHz direction finding technology available to upgrade land based SAR, and this equipment will become cost effective as the market need is established. In addition, 406MHz direction finding equipment has the ability to receive and decode the transmitted message which would contain the ELT identification and GPS coordinates (ELTs with navigation interfaces or GPS receivers). We encourage AOPA to increase the awareness of its members on the unique capabilities of 406MHz ELTs and help market the transition to make aviation safer and the industry stronger.

The illustration shows the ineffectiveness of the 121.5MHz and that any residual benefit is minor compared to the benefits of 406MHz ELTs. This discussion of the importance of time savings can be summed up from the FAA Aeronautical Instruction Manual:

"SAR forces can initiate a response to 406MHz alerts in minutes compared to the potential delay of hours for a 121.5/243.0 MHz ELT."

"According to the National Search and Rescue Plan, "The life expectancy of an injured survivor decreases as much as 80 percent during the first 24 hours, while the chances of survival of uninjured survivors rapidly diminishes after the first 3 days."

Paragraph 15:

Much has been said about alternative technologies which include PLBs, cellphones, satellite phones, satellite SMS messaging, and even ADS-B. Each one of these devices offer a method of communication under normal circumstances, and many are prevalent and readily carried by aircraft pilots and passengers. There are however, some important distinctions which make them less than reliable in an emergency situation.

The first point to make is that these technologies are not alerting devices as none provide automatic activation and signaling in the event of an aircraft crash. The major assumption in their use is that the survivor is conscious, not trapped or severely injured, they are able to locate the device, turn on the device, and have a reasonable venue from which the device can transmit from (i.e. not buried in the wreckage). ADS-B can be singled out as not having any means of indicating a crash or signaling capability. It is merely the absence of the ADS-B device from the network which might be noted, although at an indeterminant time after the fact, but will not indicate there is a problem. Many alternative technologies have GPS to determine a location of the incident, however, in the absence of a good GPS signal, a user must describe exactly where they think they are located. On the other hand, the sole purpose of an ELT is to activate in the event of a crash without the intervention of the pilot, crew, or passengers and signal immediately to SAR authorities that a serious situation has occurred. The location of the incident is also is independently determined by the Cospas-Sarsat system and can be augmented by a location coordinate from the ELT through a navigation interface or GPS receiver.

A second point is that these alternative technologies, with the exception of the PLB, are typically operated with rechargeable or replaceable batteries which are not regulated to be charged and ready in the event of an emergency. Devices which operate on aircraft power may very well be deemed inoperable in a crash. This leads to the real and distinct possibility that when most needed, the device is not fully charged or not charged at all. The ELT is designed

and is regulated to have enough battery energy onboard to activate and transmit at full power for 24 hours @ 406/121.5MHz and then an additional 24 hours @121.5MHz.

The third point is one of wireless connectivity. Cellphones and current ADS-B are line of sight terrestrial based systems. As the line or sight and range of the network are less than optimal or the network is down, then a communication link will not be made, rendering them useless in an emergency. Even commercial satellite based systems are not dedicated to emergency communication, in that if there is a backlog of messages, lack of bandwidth, or system latency, an emergency message does not get prioritization and must wait to work through the system to get delivered. There is no guarantee that the message will get through. A 406MHz ELT transmission is received by the dedicated, global Cospas-Sarsat satellite network whose sole purpose is to detect and deliver emergency messages to the SAR authorities.

Fourth, the issue of getting the emergency message to SAR authorities remains. The alternative technologies listed (*sans* the PLB) do not have direct and dedicated connection to SAR authorities. If a message can be delivered, it must be relayed through local 911, a friend or family member, a third party call center, or even an email which then must be interpreted, vetted, and then when validated, it is passed on to SAR authorities. An ELT operates on a global infrastructure which is dedicated to SAR emergencies and SAR authorities can quickly respond to situations.

Finally, the issue of cost has to be addressed. Current ELT costs are on the order of $700-$1200 plus installation. Handheld satellite based tracking solutions have initial retail costs of $100-$300 and recurring subscription costs of $100-$600 annually. A recent AOPA web article published the uninstalled cost of one manufacturer's ADS-B products: "*The retail price for an [ADS-B Receiver] is $1,695; the [ADS-B Transceiver] is $3,995, and the [ADS-B Transceiver + GPS] is $4,995.* " Within these price ranges, and in light of the operational short comings of the alternative technologies, it is clear that 406MHz ELT offers superior value to the user for dedicated SAR alerting and locating in all conditions, anywhere in the world.

ACR/Artex does, however, support the use of Personal Locator Beacons as a secondary backup technology to an airframe mounted, automatically activated ELT. With its reserve battery energy, its global connectivity, and global SAR infrastructure, a PLB further increases the

probability of able survivors to signal and be located for rescue in the event the pilot needs to leave the immediate vicinity of the aircraft.

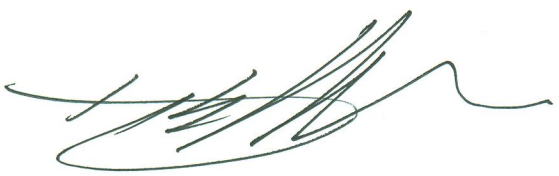
Other factors in support of the use 406MHz ELTs include the Cospas-Sarsat plans to deploy Mid Earth Orbit Satellite Search and Rescue (MEOSAR) payloads. As outlined in the MEOSAR presentation at the NTSB GA SAR Forum in July 2012 (*Knox*), MEOSAR represents a significant modernization of the current Cospas-Sarsat with the full support of USAF and USCG SAR. This satellite constellation will provide a new constellation of satellites with near instantaneous global coverage with increased accuracy of independent location capability. This will further reduce the SAR Response Chain with faster detection and validation of emergencies**.** Current generation 406MHz ELTs would be fully compatible to operate on the MEOSAR system. In addition, the MEOSAR system with 406MHz ELTs is being considered by Cospas-Sarsat and ICAO for use for in flight triggering of the ELT to track a distressed flight prior to the crash. So not only is the current implementation of 406MHz ELTs on the Cospas-Sarsat system superior to any alternative technology, the roadmap in decades to come offer an even better system and will afford SAR better operational information on the detection, location, and timely rescue of aircraft crashes. The 406MHz ELT is far from being obsolete technology, period.

Conclusion:

In conclusion, ACR/Artex agrees with the proposed phase-out of 121.5MHz ELTs including the further certification, manufacture, importation, sale, and use of such devices. The cancellation of FAA TSO-C91a prohibits further the certification of new 121.5MHz ELTs as of December 1, 2012. There should be no further manufacture or importation of 121.5MHz ELTs, batteries, or serviceable parts as of the effective date of rule adoption based on the *Third FNPRM*. We agree with the proposed 1 year transition period on the sale of 121.5MHz ELT in order to deplete finished goods inventory at manufacturers, distributors, and installers, noting however that battery replacement and servicing would not be allowed. Finally, we support the prohibition of the continued use and servicing of 121.5MHz ELTs on a specific date no more 2- 3 years from the effective date of rule adoption based on the *Third FNPRM*.

We support the adoption and proliferation of 406MHz and combination 406/121.5MHz ELTs for reasons of technical and operational superiority in saving lives. This position is supported by both USAF and USCG Search and Rescue authorities. Simply put, ELTs utilizing 406MHz technology provide unparalleled, time critical, and location based alerting necessary for SAR to more successfully carry out their mission of saving lives. The adoption increases aviation safety and is in the interest of the public good.

Sincerely,



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